

## Course Descriptions

### AE 4131

#### **Auto CAD**

This course teaches how to use AutoCAD, a computer aided design tool, in the production of landscape and drafting designs. The student will learn the basics of creating a design using the computer and many of the advanced features a CAD program makes available. 3 hours Lecture and Practicum — 3 credits

### AE 4211

#### **Seminar (Agronomy)**

The course includes student reports and discussion on recent scientific findings in soils, field crops, and related subjects. 4 hours Discussion — 4 credits (one credit per year)

### AE 4218

#### **Seed Science**

The uses of seeds can be grouped into two categories: 1) seeds are sold to growers for agronomic and horticultural plant production; 2) seeds are raw material to be transformed into useful products such as chemicals for manufacturing animal feed, and human foods. This course investigates how seeds are produced, harvested, cleaned, stored, and marketed. Discussions about the role of biotechnology, state and federal regulations, international trade agreements, and environmental protection will be included. Prerequisite: Field Crops I or Soils. 3 hours Lecture and Discussion — 3 credits

### AE 4222

#### **Golf Course Design and Construction**

This course covers the basic principles, practices, and procedures of golf course design and construction. Highlights include a field trip to local golf courses and a design project. 3 hours Lecture and Discussion — 3 credits

### AE 4230

#### **Case Studies in Turf Management**

In this advanced course students will improve their competence and confidence in solving problems in turf management. Students will be presented with actual turf management problems from a wide array of turfgrass systems and they will develop, describe, and defend their solutions both orally and in writing. Prerequisites: Introduction to Turf Management, Turfgrass Cultural Systems, and Turfgrass Pest Management, or Permission of Instructor. 3 hours Lecture and Discussion — 3 credits

## Employment Program

### AE 2370

#### **Employment Program**

Each student in Agronomy and Environmental Science is required to spend 500 hours in approved jobs related to the student's major. Registration for each Employment Program must occur prior to the beginning of a relevant experience. Registration materials are available from the Office of Career and Life Education, located in Segal Hall.

## ANIMAL BIOTECHNOLOGY AND CONSERVATION (ABC)

### SA 1105

#### **Introduction to Animal Management**

This introduction will emphasize animal care and management in relation to animal characteristics, control, handling, restraint, animal facility design, and legal compliance. Students will become acquainted with a variety of animals, their origin, characteristics, and usage. Basic experimental techniques will be acquired in the laboratory component of the course. Fall semester. 2 hours Lecture and 3 hours Laboratory-3 credits

### SA 2001

#### **People and Animals**

The student will learn about the relationship between people and animals through domestication, religion, culture, farming, research and pets. The role of pets in the family will be examined. The role of animals in human health and the effect of humans on animals will also be discussed. This course is a prerequisite for Animal Assisted Activities and Therapy. Fall semester. 3 hours Lecture and Discussion — 3 credits

### SA 2101

#### **Animal Assisted Activities and Therapy**

The course explores the use of AAA and AAT in different fields including education, psychology and physical therapy. By exploring the different areas, students will learn how to develop, present and implement an AAA/AAT program and gain an understanding of the responsibilities that go along with such programs. Prerequisites: People and Animals. Spring semester. 3 hours Lecture and Discussion — 3 credits

**\*SA 2110**

***Exotic Animal Husbandry***

This course will explore the major aspects of caring for captive wildlife and responsible collection management. We will emphasize both the limitations and positive impact zoos have on conservation. Topics covered will include, but are not limited to, responsible stewardship, population management, captive breeding, reintroduction, nutrition and feeding, health, reproduction, observation, and the design and care of exhibits. This course will be limited to students in the Zoo Science major as of Fall 2004. 3 hours Lecture and Discussion — 3 credits

**\*SA 2113**

***Wild Animals in Captivity***

Wildlife care and management has evolved over the years into a scientific discipline requiring specialized training. This course is intended as a hands-on course to complement Introduction to Zookeeping. We will emphasize hands-on applications, including handling and restraint of wild animals, using the collection at the Elmwood Park Zoo. Enrollment is limited to students in the Zoo Science major. Prerequisites: Concurrent enrollment in Introduction to Zookeeping or Permission of Instructor. Fall semester. 2 hours Lecture and 3 hours Laboratory — 3 credits

**\*SA 2218**

***Animal Training and Enrichment***

We will explore operant conditioning and basic principles of animal psychology. Students will learn how to use these principles to train both domestic and wild animals and to improve their psychological well being in captivity. Major components of enrichment will be reviewed with respect to the principles of animal management. This course provides the hands-on experience needed to apply behavioral techniques to the management of captive populations. Prerequisite: Wild Animals in Captivity. Spring semester. 2 hours Lecture and 3 hours Laboratory — 3 credits

**SA 2220**

***Animal Record Keeping Systems***

This course will introduce students to data collection, record keeping, studbook analysis, and the specialized software used by zoos for animal information systems and collection management. Students will be able to complete accurate records for daily husbandry, medical care, species inventory and shipping. They will use computer technology to access data, transform that data into information, and communicate that information to others. Prerequisites: Information

Technology Concepts and Computer Applications. 2 hours Lecture and Discussion — 2 credits

**SA 3000, 4000**

***Selected Topics I and II***

Special projects are designed to meet individual needs of students in their respective fields. Projects will be arranged on a one-to-one basis with a department faculty member and with the approval of the Department Chairperson. A maximum of two credits will be accepted toward graduation. 3 hours student/faculty instruction per week — 1 credit each

**SA 3032**

***Herpetology***

This course will explore the major aspects of the biology of the amphibians and reptiles. We will examine the structure and function of these animals as individuals, populations, and biotic communities. Aspects to be covered include the general anatomy of the “herptiles” and the evolution and taxonomy of modern reptiles and amphibians. A review of biodiversity and systematics will be incorporated within the course. Prerequisites: DS 3118, SA 1105 or SA 2110. Biological Science I and II. 2 hours Lecture and 3 hours Laboratory — 3 credits

**SA 3034**

***Mammalogy***

This course will present a broad overview of the field of mammalogy, including the evolution, structure, diversity, taxonomy, biogeography, and behavioral ecology of mammals. The laboratory component of the course will emphasize physical structure and development, field methods, and systematics, with an emphasis on local mammalian fauna. Prerequisites: DS 3118, SA 1105 or SA 2110. 2 hours Lecture and 3 hours Laboratory — 3 credits

**SA 3112**

***Wildlife Management***

The process of managing wildlife presents a broad array of problems, from the protection of endangered species to the control or elimination of pests. The objective of the course is to apply major ecological concepts to the practice of wildlife management. In lecture, we will examine how ecological principles can be used to devise viable management strategies. The laboratory will be devoted largely to field methods for studying wildlife and the identification of terrestrial vertebrates. Students will be required to attend outside field trips, complete evening field work, and prepare study specimens of mammalian

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skins and skulls. Prerequisites: SA 1105 or SA 2110; AE 3125 Principles of Ecology or BY 2108 Ecology; BY 1113/1114 Biology I and II or BY 1116/1117 Biological Science I and II. Fall semester. 2 hours Lecture and 3 hours Laboratory — 3 credits

### **\*SA 3115**

#### ***Zoo Internship I: Animal Care***

This internship will allow students to work with keepers and develop hands-on skills, including proper care, handling, restraint and behavioral observation of wild animals, using the collection at the Elmwood Park Zoo. The internship experience will culminate in a final project requiring students to develop plans for a new exhibit or enrichment program at the zoo. Note that this internship does not apply to the employment program requirement. Enrollment is limited to students in the Zoo Science major. Prerequisites: SA 2110 Introduction to Zookeeping, SA 2113 Wild Animals in Captivity, SA 2220 Animal Record Keeping Systems. Fall or spring semester — 2 credits

### **SA 3124**

#### ***Animal Behavior***

An introduction to the analysis of animal behavior, emphasizing an evolutionary approach. We will investigate animal behavior through both the ecological processes that have driven the evolution of behavior and the physiological mechanisms that allow behaviors to be performed. A major objective of the laboratory will be to foster a strong sense of how science proceeds. You will be encouraged to ask your own questions and design your own experiments whenever possible. You will work in groups to determine your goals, set predictions, create appropriate tests, and analyze your results. Prerequisites: Required: BY1113/1214 Biology I and II or BY 1116/1217 Biological Science I and II; Recommended: BY 2108 Ecology. Spring semester. 2 hours Lecture and 3 hours Laboratory — 3 credits

### **SA 3150**

#### ***Behavior/Management of Alternative Agricultural Animals***

This course is designed to acquaint students with alternative agricultural animals that are raised for meat, fiber, leather and/or companionship. It will acquaint students with the behaviors and uses of these animals as well as general anatomy and physiology, nutrition, medical care and routine husbandry practices related to these animals, with comparisons made to similar domestic animals. Animals to be dis-

cussed will include camelids, ratites, cervids, game birds, and bison as well as unusual breeds and types of domestic animals such as sheep, cattle, swine, goats and equids. Fall semester. 3 hours Lecture — 3 credits.

### **\*SA 3216**

#### ***Zoo Internship II: Public Education***

This internship will allow students to work with the educational staff at the zoo, using the collection at the Elmwood Park Zoo. Students will assist in teaching special classes to students from primary and secondary schools as part of the zoo's docent program or outreach efforts. They may also work with scouting programs, seniors, or other groups visiting the zoo for educational functions. The internship experience will culminate in a final project requiring students to develop plans for a new educational program at the zoo. Note that this internship does not apply to the employment program requirement. Enrollment is limited to students in the Zoo Science major. Prerequisites: SA 2110 Introduction to Zookeeping, SA 2113 Wild Animals in Captivity. Fall or spring semester — 2 credits

### **SA 4016**

#### ***Senior Seminar***

This course is a study of recent research within the field of animal biotechnology and conservation on topics selected by students with special emphasis on oral presentations. 1 hour Lecture and Discussion — 1 credit

### **SA 4041**

#### ***Senior Research***

Selected seniors with at least a 2.5 GPA may engage in supervised investigations involving library work and laboratory or field experiments related to small animal science. Prerequisites: Permission of the Department Chairperson and faculty sponsorship. 1-3 credits

### **SA 4051**

#### ***Current Topics***

This research and discussion course emphasizes topics of current interest to the field of animal science and conservation. It may be repeated for a maximum of 2 credits. 1 hour Lecture and Discussion — 1 credit

### **\*SA 4123**

#### ***Zoo Animal Health and Disease***

The housing of multiple species under the close conditions requires careful training in the prevention of disease outbreaks and cross-species contamination. This course will emphasize both disease prevention

in exotic collections and managing the risk of zoonotic diseases. We will cover both specific information on animal disease and an introduction to clinical pathology, as it applies to the management of wild animals in captivity. Prerequisites: DS 3118 Anatomy and Physiology I, BY 3002 General Microbiology, or Permission of Instructor. 2 hours Lecture and 3 hours Laboratory — 3 credits

**SA 4124**

***Pathology and Diseases of Small Animals***

This is an advanced course addressing the basis of development of disease and the effect the process induces on tissues, organs, and the body. The last third of the course examines specific diseases or disease conditions of small animals. Prerequisites: DS 3118 Anatomy and Physiology I, BY 3002 General Microbiology, or Permission of Instructor. Spring semester. 2 hours Lecture and 3 hours Laboratory — 3 credits

**SA 4129**

***Clinical Pathology***

This subspecialty of pathology is concerned with the theoretical and technical aspects (methods or procedures) of chemistry, bacteriology, virology, mycology, parasitology, immunology, hematology, and biophysics as they pertain to the diagnosis of disease and the care of animal patients. This course stresses deductive reasoning. Prerequisites: SA 4124 Pathology and Diseases of Small Animals, DS 3118/3221 Anatomy and Physiology I and II, or Permission of Instructor. Fall semester. 2 hours Lecture and 3 hours Laboratory — 3 credits

**SA 4222**

***Reproduction of Small Animals***

This course deals with the special problems encountered in small animal reproduction. An extensive laboratory emphasizes manipulation of the reproductive system, application of techniques utilizing hormones, fertilization, fetal development and in vitro manipulation of murine gametes and embryos. Prerequisites: SA 4121 Small Animal Management and DS 3118/3222 Anatomy and Physiology I and II, or Permission of Instructor. Fall semester. 2 hours Lecture and 3 hours Laboratory — 3 credits

**SA 4224**

***Nutrition for Exotic Animals***

This course deals with the special nutritional problems posed by wild animals in captivity. Zoos contain hundreds of species, each representing a digestive strategy

for a specific ecological niche. Adapting a substitute diet to meet these varied needs is a challenge. Students will combine information on natural history, historical records, and domestic animal models to design feeding programs for captive wildlife. Prerequisites: CH 2003 Principles of Organic Chemistry or CH 2120 Organic Chemistry I. 2 hours Lecture and 3 hours Laboratory — 3 credits

**SA 4225**

***Small Animal Research Techniques***

Students are introduced to all phases of research from literature search, planning and performing experiments, to the writing of a research paper. Further experience is gained in anesthesia, surgical techniques, and animal models of human disease. Transgenic technology is discussed extensively and techniques are introduced in the laboratory. Techniques that reduce the number of animals used in research are stressed. Prerequisites: Required: SA 4121 Small Animal Management, DS 3118/3222 Anatomy and Physiology I and II or BY 2223 Comparative Anatomy and BY 4257 Comparative Physiology, or Permission of Instructor. Recommended: SA 4222 Reproduction of Small Animals. Spring semester. 2 hours Lecture and 3 hours Laboratory — 3 credits

***Employment Program***

**SA 2370**

***Employment Program***

Each student is required to spend 500 hours in approved employment related to the student's major. Registration for each Employment Program must occur prior to the beginning of a relevant experience. Registration materials are available from the Office of Career and Life Education, located in Segal Hall — 4 credits

*\* All or part of the course will be taught at an off-campus location. Students must provide their own transportation.*

***ANIMAL SCIENCE - LARGE (AS)***

**AS 1000**

***Survey of Animal Agriculture***

Large Animal Science students, matriculating from approved High School Vo-Ag programs, may receive 3 elective credits at the end of their freshman year at Delaware Valley College. Contact the Large Animal Science Department for application procedures — 3 credits